CLEFT RHINOPLASTY

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GSR Institute of Facial Plastic Surgery

- Non-profit hospital established in 1996
- Dedicated Cleft & Craniofacial Centre of Excellence
- Presently 1,600 cleft and cranio-facial surgeries are done every year
- 4 surgeons and 6 fellows with full support team
- More than 40,000 documented cleft & craniofacial surgeries have been performedsince 1996
- 600 primary new born cleft children are registered every year

CLEFT AND CRANIOFACIAL NASAL DEFECTS

CONGENITAL NASAL DEFECT

Nasal aplasia

Heminasal aplasia

CLEFT NASAL DEFECT

Unilateral cleft nasal defect

Bilateral cleft nasal defect

COMPLEX NASAL DEFORMITY

Nasal Duplication

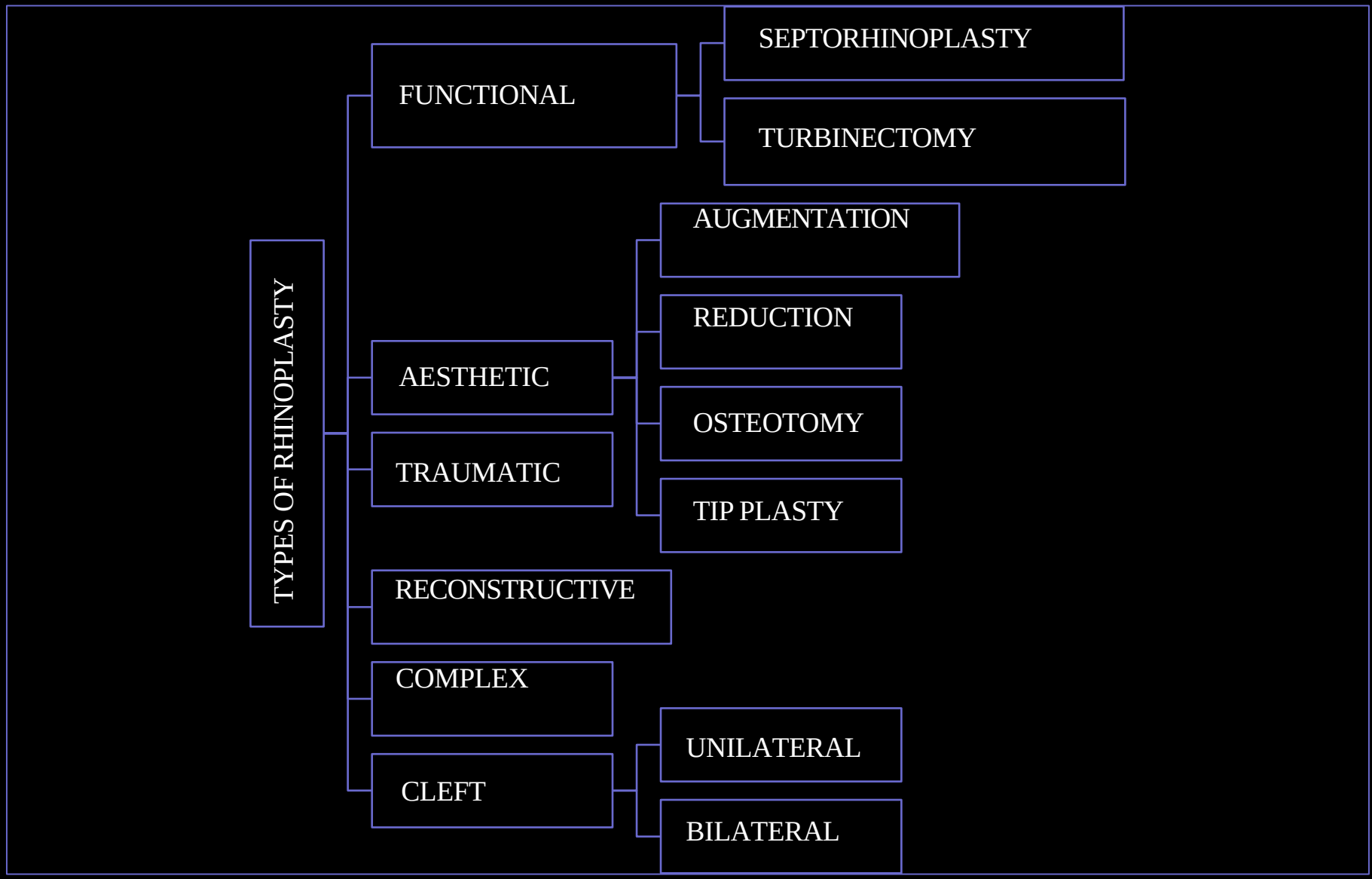
CRANIOFACIAL NASAL DEFECT

CRANIOFACIAL CLEFT NASAL DEFECT

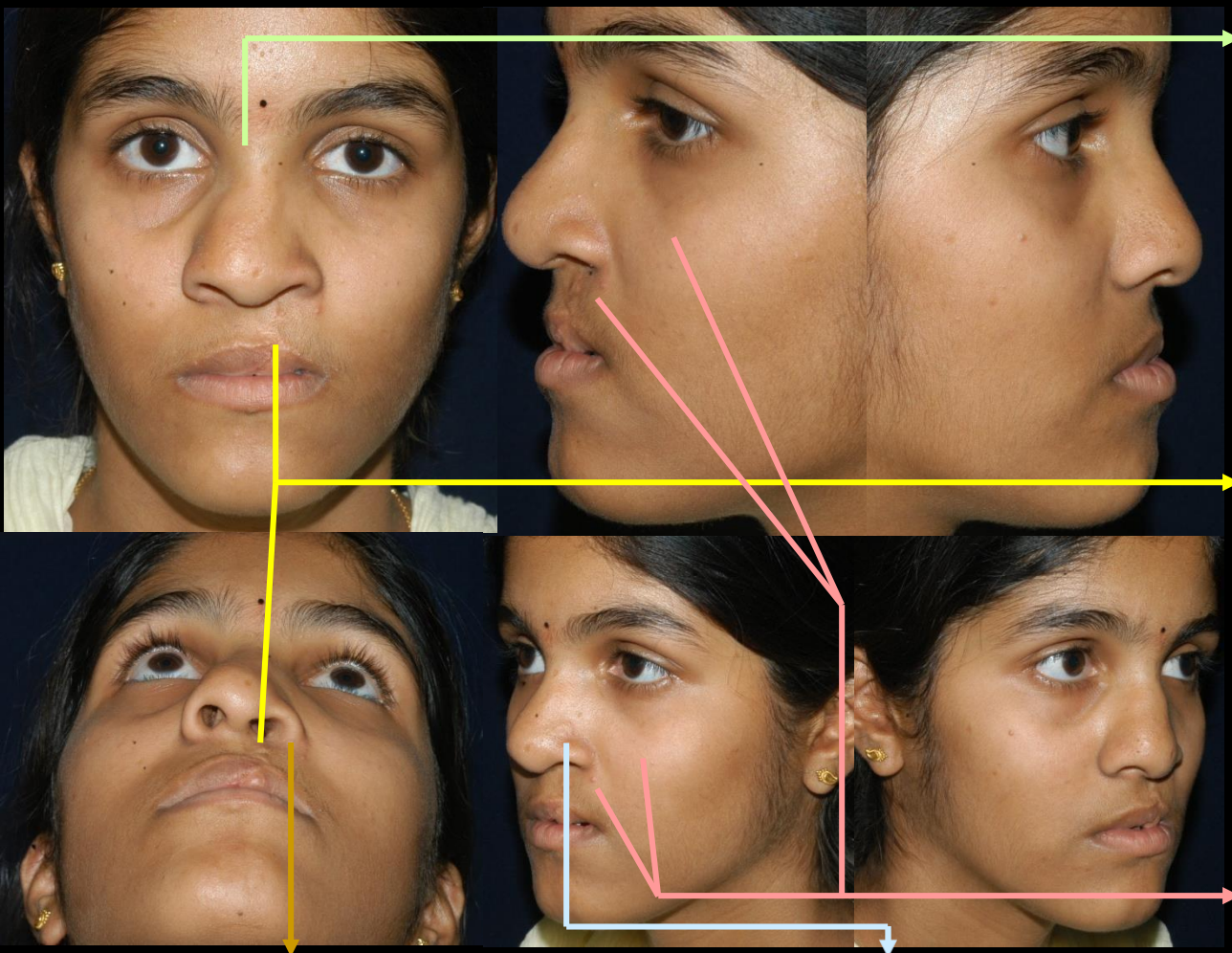
Tessier # 2 facial cleft

Tessier # 3 facial cleft

TYPES OF RHINOPLASTY



CLEFT NASAL DEFECT



SEPTAL DEVIATION
Towards non cleft side due to lateral position of anterior nasal spine

SCAR of the cleft lip
Surgery distorting the ala

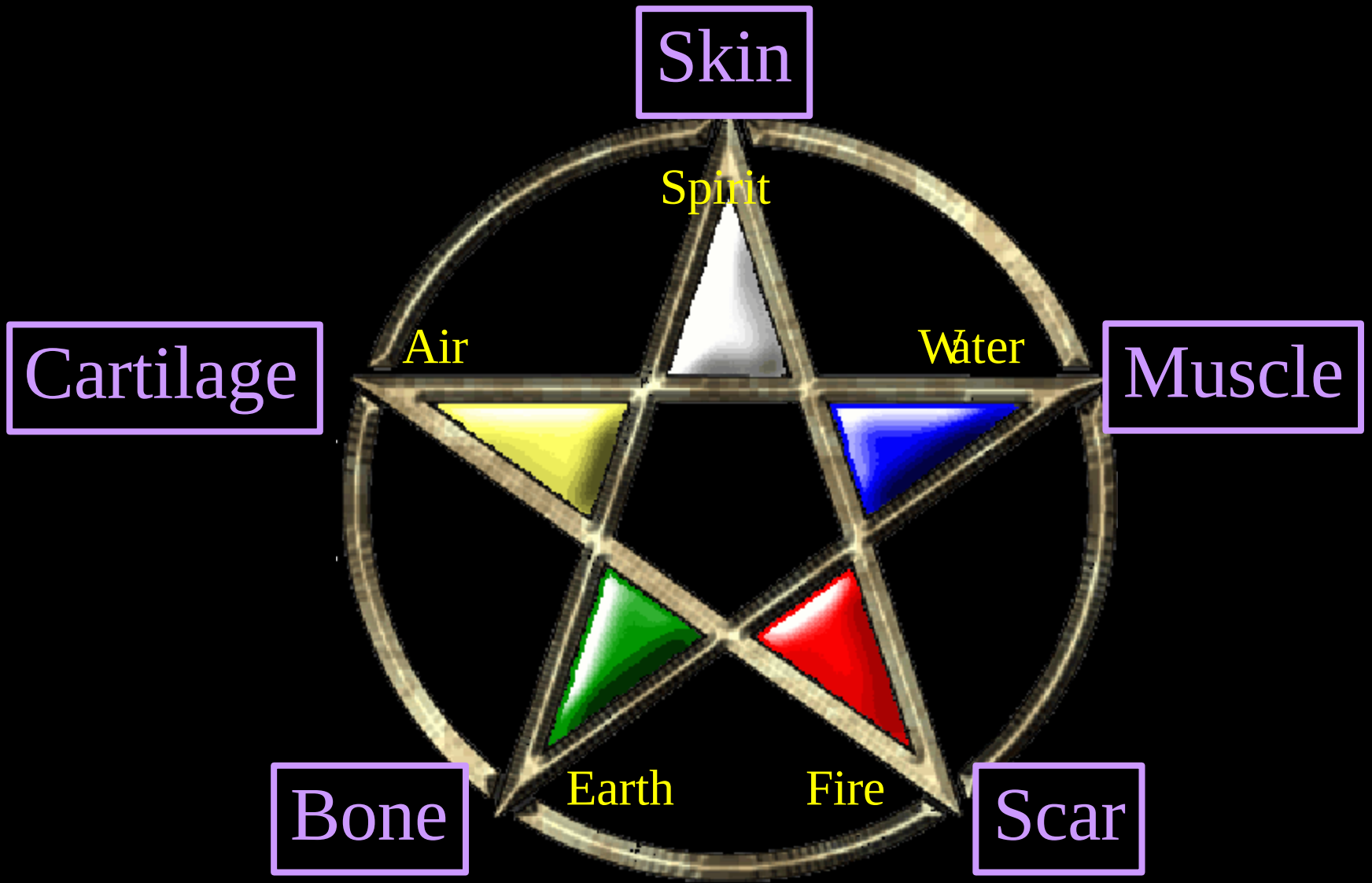
Underlying alveolar and piriform BONY DEFECT not stabilized
Maxillary Hypoplasia on cleft side

NASALIS MUSCLE not positioned during primary lip repair

OVERLYING SKIN
Stretched over the nostril on cleft side

CLEFT NOSE DEFECT

PROBLEM PENTACLE



ANATOMY OF CLEFT NOSE

UNILATERAL CLEFT

- The alar cartilages will not be at the same level
- The septum will be deviated towards the non cleft side

ANATOMY OF CLEFT NOSE

BILATERAL CLEFT

- The alar cartilages may be at the same level but will be buckled
- The septum will not be deviated but will also be buckled

CLEFT RHINOPLASTY

Treatment for the cleft nose has to include all or some of the following

Rhinoplasty with

Secondary lip repair,

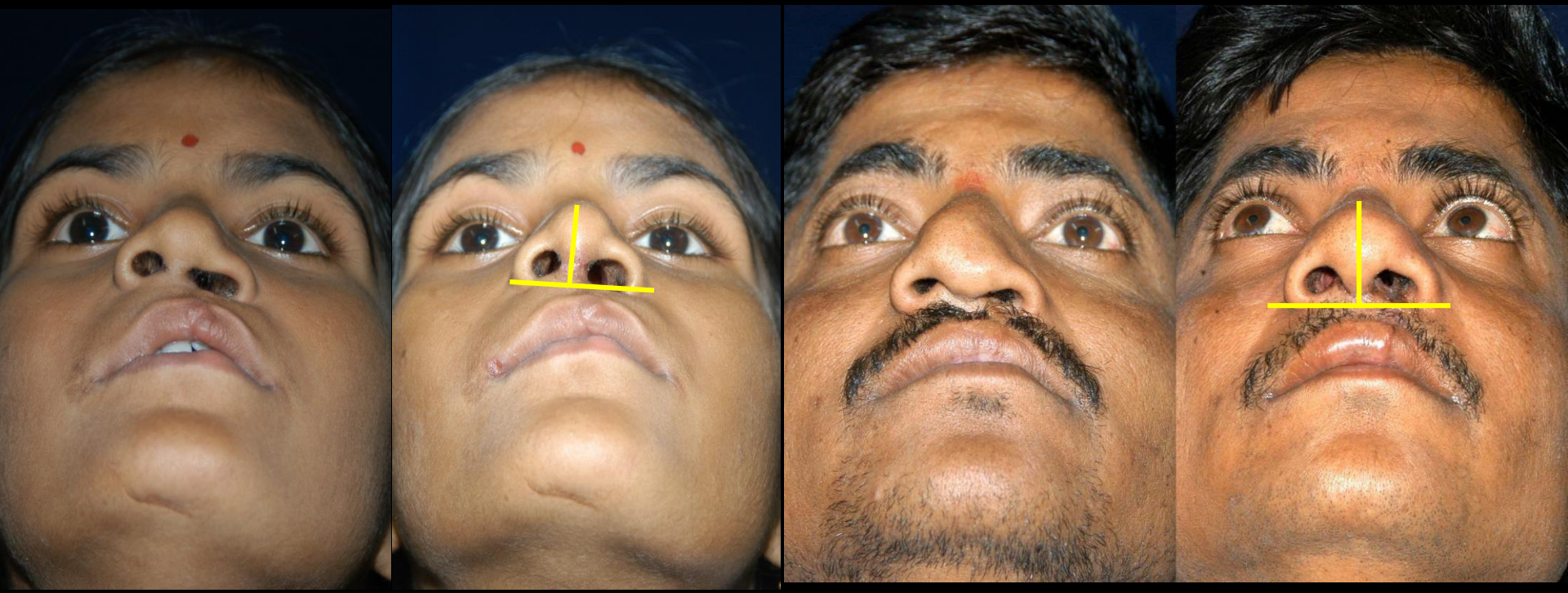
Alveolar bone grafting and

Maxillary advancement

We should call it PROFILOPLASTY

THE NEED FOR BONE GRAFTING

Prior to Rhinoplasty



THE NEED FOR MAXILLARY ADVANCEMENT

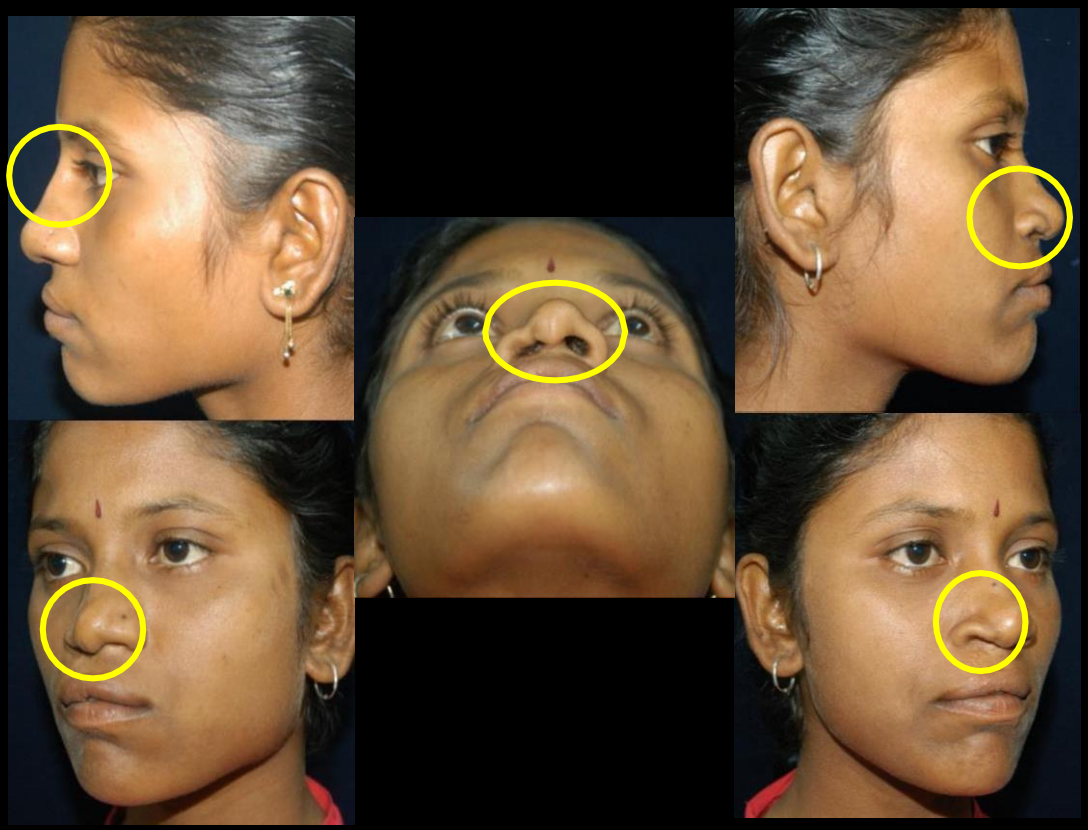
Prior to Rhinoplasty

QUALITY OF SKIN OF NOSE IN RHINOPLASTY

THICK SKIN	THIN SKIN
Does not show small irregularities	Small irregularities become visible
Failure to contract-excess soft tissue scar	Early healing- Less oedema
Masks refinement and definition	Ensures that bony/cartilaginous grafts or implants are precisely positioned and smoothly contoured

MORPHOFUNCTIONAL CLEFT RHINOPLASTY

SURGICAL APPROACH



-Columella Lengthening,

- Septal Repositioning,

- Radix Grafting,

- TipAugmentation,

- Lower Lateral Cartilage Repositioning,

-Alar Base Wedge Resections,

- PiriformAugmentation,

-Nasal Bone Osteotomies

S. Gosla Reddy et al. / Assessment of nostril symmetry after primary cleft rhinoplasty in patients with complete unilateral cleft lip and palate; Journal of Cranio-Maxillo-Facial Surgery 41 (2013) 147 -152

Morpho-Functional Septorhinoplasty in Adult Patients With Unilateral Cleft Lip Nasal Deformity: A Comprehensive Approach

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Purpose: The aim of this study was to introduce a morpho-functional technique of rhinoplasty for correction of defective nasal morphology of the secondary unilateral cleft lip and improvement of air passage through the nose.

Materials and Methods: The described comprehensive approach follows the rule of 5 *R*'s: relieve, resect, reposition, restructure, and restrengthen. The extended septal graft serves as a columellar strut on the one hand and as a spreader graft on the other hand.

Results: The described morpho-functional septorhinoplasty technique is effective for correction of the unilateral cleft lip nasal deformity because it improves the symmetry of the nose, improves the morphology of the alar cartilage, and increases the nasal tip projection. An improvement in breathing occurs as a result of restored symmetry of the ala and nasal vestibule.

Conclusions: Morpho-functional septorhinoplasty is a practical tool to handle adult patients with secondary cleft nasal deformities.

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Primary and secondary nasal deformities are commonly associated with congenital cleft lips, and their correction requires a focused treatment targeting both morphology and function. It is an evident fact that a repaired cleft is revealed more by the associated nasal deformities than by the repair line of the lip.[1,2] Nasal septal deviation, nasal tip asymmetry, and shortening of the columellar length are some of the common problems faced by surgeons dealing with the correction of unilateral cleft nasal deformities.

Unilateral secondary nasal deformities can show the following features on the cleft side[3] (Fig 1):

1. Retro-displaced and less well-projected dome
2. Lateral slumping of the medial crus
3. Foreshortened columella
4. Caudal hooding of the lower lateral cartilage and alar rim

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Morphofunctional Septorhinoplasty in adult patients with unilateral cleft lip nasal deformity: A Comprehensive Approach

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Conclusion: The morpho-functional septorhinoplasty is a practical tool to handle adult patients with secondary cleft nasal deformities

CLEFT RHINOPLASTY -SURGICAL APPROACH

UNILATERAL CLEFT RHINOPLASTY

Marking

In Patients with Shortened Columella

Tejima

- Decreases the excess soft triangle tissue and reduces the nasal web.

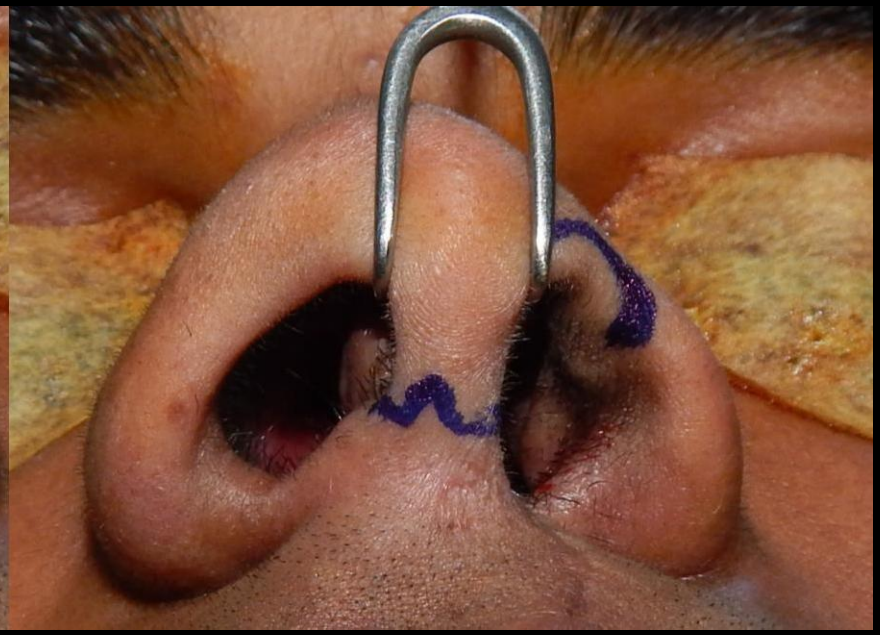
V- Y

- Increases length of columella
-Especially increaseslengthof medial crura
-Revise the cleft lip scar contracture.

Unilateral Cleft Rhinoplasty

Marking

Patients with adequate columellar length



Tejima

-Decreases the excess soft triangle tissue and reduces the nasal web.

- Medial rotation of tejima flapgives columellar lengthon cleft side

Transcolumellar

Indicated in

- Narrowed cleft nostril
- Scar at columellar base

The rule of 5 R's for Deviated Nasal Septum

-Relieve,

-Resect,

-Reposition,

-Restructure

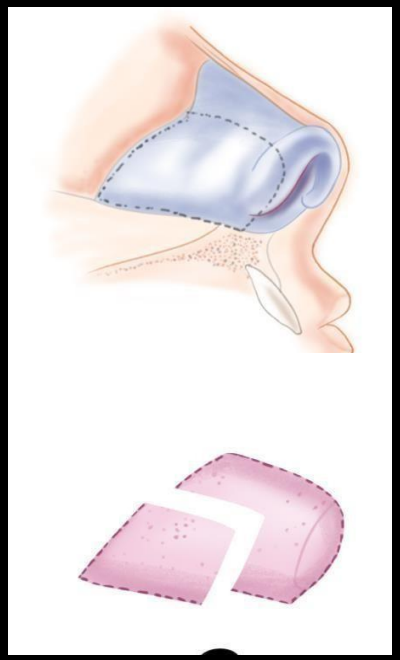
-Restrengthen

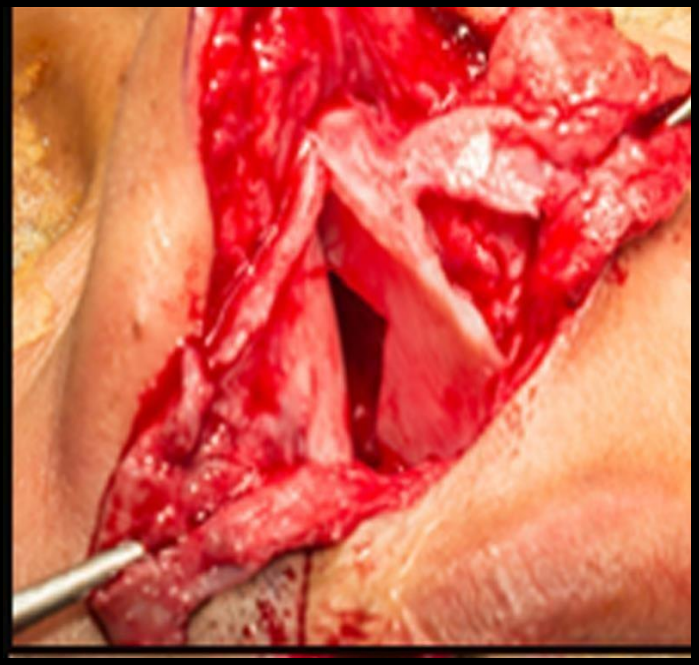
Unilateral Cleft Rhinoplasty

RELIEVE

- Exposing the septum
    - Note the extreme angle of caudal part of the septum due to its attachment to the anterior nasal spine which in cleft defects is lateralized towards the cleft side.

Unilateral Cleft Rhinoplasty



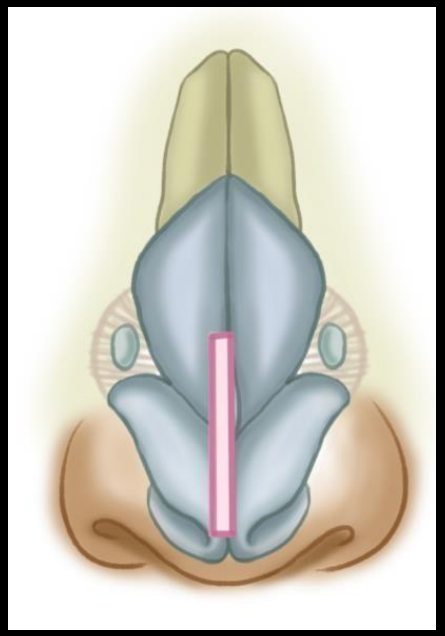


RESECT

- At least 1 cm should be maintained superiorly and anteriorly in an 'L'shaped configuration to provide support for the nose.

- Septoplasty is done by resecting the posterior and inferior end of the septum.

Unilateral Cleft Rhinoplasty



REPOSITION

- The septal graft extends into the medial crura and rests upon the maxillary septal groove. The septal graft also acts like a spreader graft as it is placed on the cleft side in between the upper lateral and septal cartilage.

- The extended septal graft is then stabilized antero- caudally by drilling a hole into the bone on the cleft side.

CHOICE OF GRAFT

1. **SEPTAL GRAFT**

- Preferred in patients with strong radix and adequate tip projection but weak lower lateral cartilage

2. **SEPTAL AND AURICULAR GRAFT**

- Patients requiring tip elevation and/or minimal radix support

3. **COSTO-CHONDRAL GRAFT**

- Preferred in patients presenting with total loss of radix support and tip projection
- Patients operated for extensive maxillary advancement and distractions
- Redo Rhinoplasties

Unilateral Cleft Rhinoplasty

TYPES OF GRAFT

- **EXTENDED SEPTAL GRAFT** – tip projecting upward , outward and anteriorly extending about 6-8 millimeters in front of the septum so as to increase the columellar show

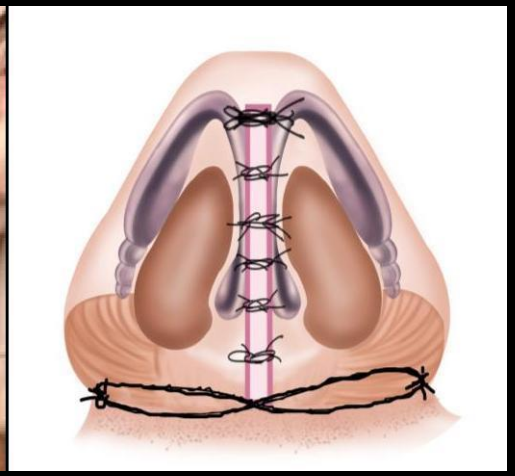
- **COLUMELLAR STRUT GRAFT** - to increase the nasal tip support

- **SHIELD GRAFT** - to accentuate the tip projection

- **ALAR BATTEN GRAFT** - to strengthens the lateral crus of the lower lateral cartilage

Unilateral Cleft Rhinoplasty



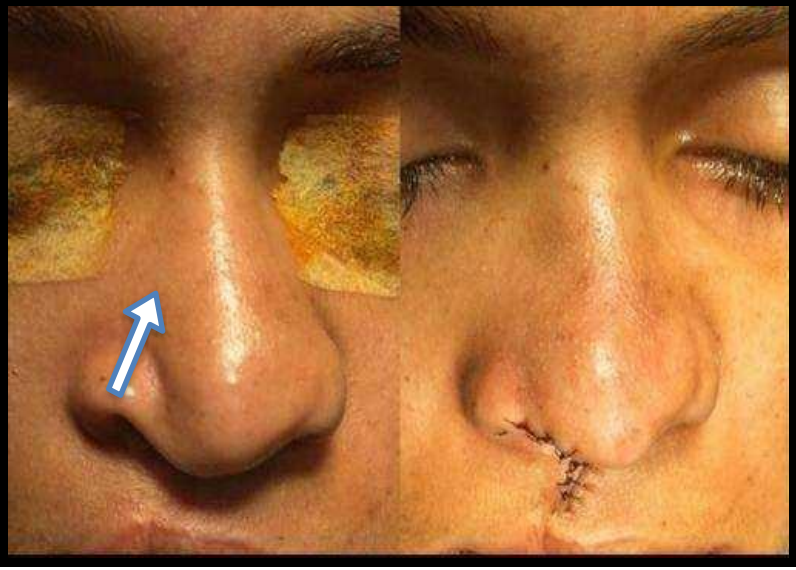


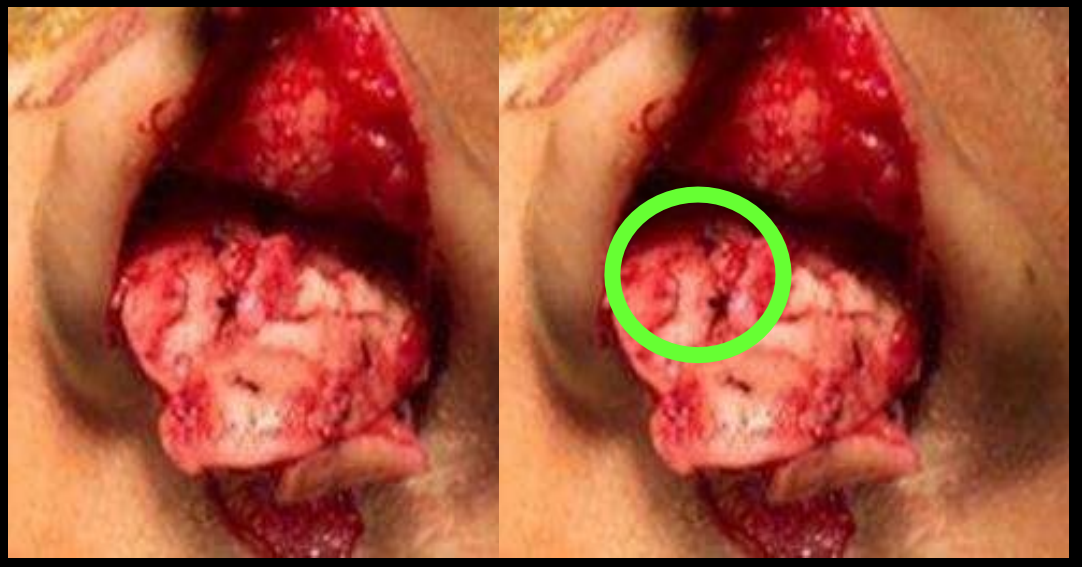
RESTRUCTURE & RESTRENGTHEN

- 18-gauge needle is inserted through the skin at the level of alar base groove and exits at the anterocaudal part of extended septal graft.
- The anterocaudal part of septal graft is fixed in position by two bilateral alar nasalis muscle sling sutures using 4-0 polypropylene sutures.
- Medial crural foot plates are sutured with septal cartilage using horizontal mattress sutures.

Unilateral Cleft Rhinoplasty

- **CEPHALIC TRIMMING** if required - Wide LLC on one side can make the nose appear asymmetric. Small cephalic strips of LLCs can be excised in such patients. This maneuver narrows a bulbous nasal tip and improves symmetry.
- Approximation and suturing of the **upper lateral cartilage**
- **LATERAL CRURAL STEAL** if required – To lift the lower lateral cartilage on the cleft side and to improve projection
- **INTRADOMAL AND TRANSDOMAL** sutures placed





Unilateral Cleft Rhinoplasty

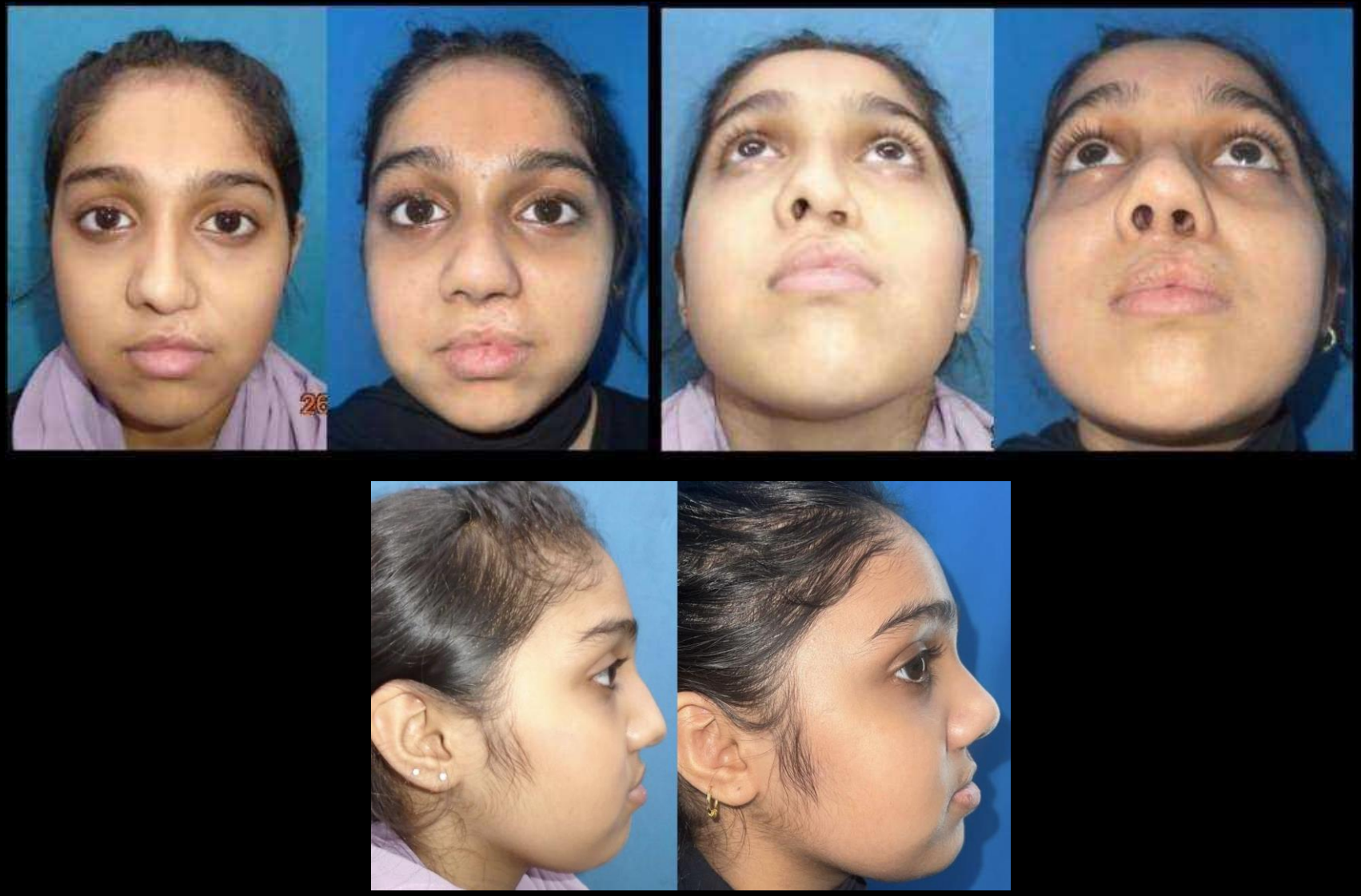
Closure

Quilting sutures are placed using 3-0 vicryl sutures over the nasal septum to eliminate the dead space between the dissected perichondrium on either side.

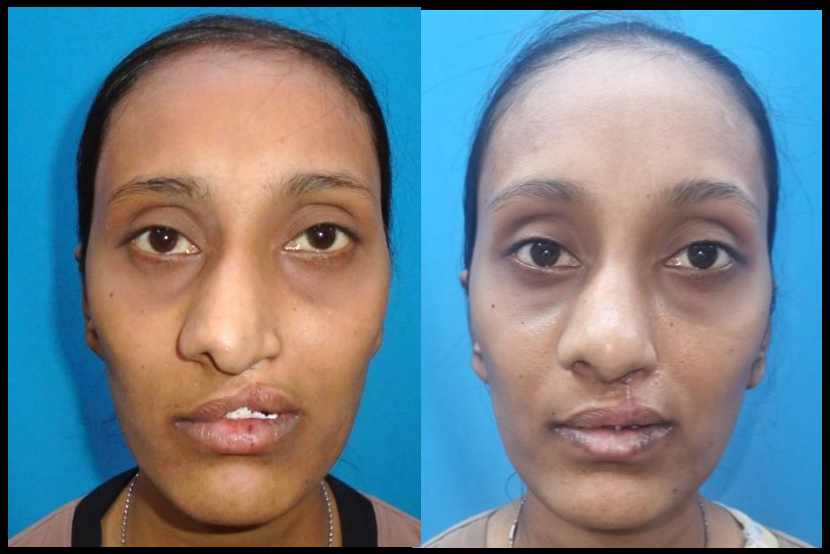
Unilateral Cleft Rhinoplasty with Septal Grafting

Unilateral Cleft Rhinoplasty with Septal Grafting

Unilateral Cleft Rhinoplasty with Septal Grafting



Unilateral Cleft Rhinoplasty with Septal and Auricular Grafting

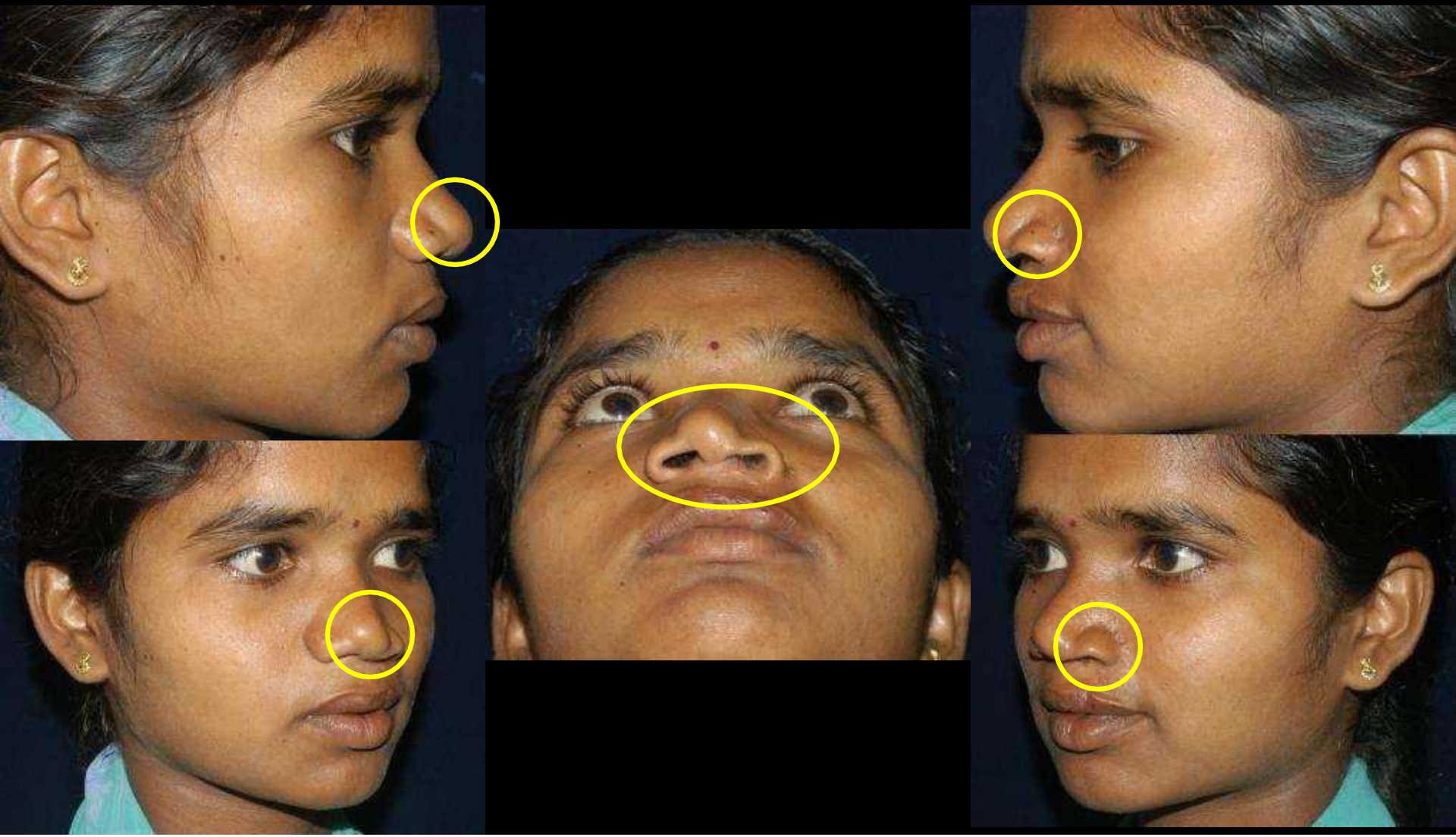


Unilateral Cleft Rhinoplasty with Septal and Auricular Grafting




Unilateral Cleft Rhinoplasty with Septal and Auricular Grafting

Unilateral Cleft Rhinoplasty with Costo-Chondral Grafting



Unilateral Cleft Rhinoplasty with Costo-Chondral Grafting

- Positioning and fixing the strut

- Dorsal augmentation is done when necessary [in such cases the graft is held in place using radix stabilizing sutures placed over two layers of dressing (steri-strips) instead of placing it directly over skin so as to prevent pressure marks on the skin.

Unilateral Cleft Rhinoplasty with Costo-Chondral Grafting

- Positioning the Baton graft to strengthen the ala on the cleft side

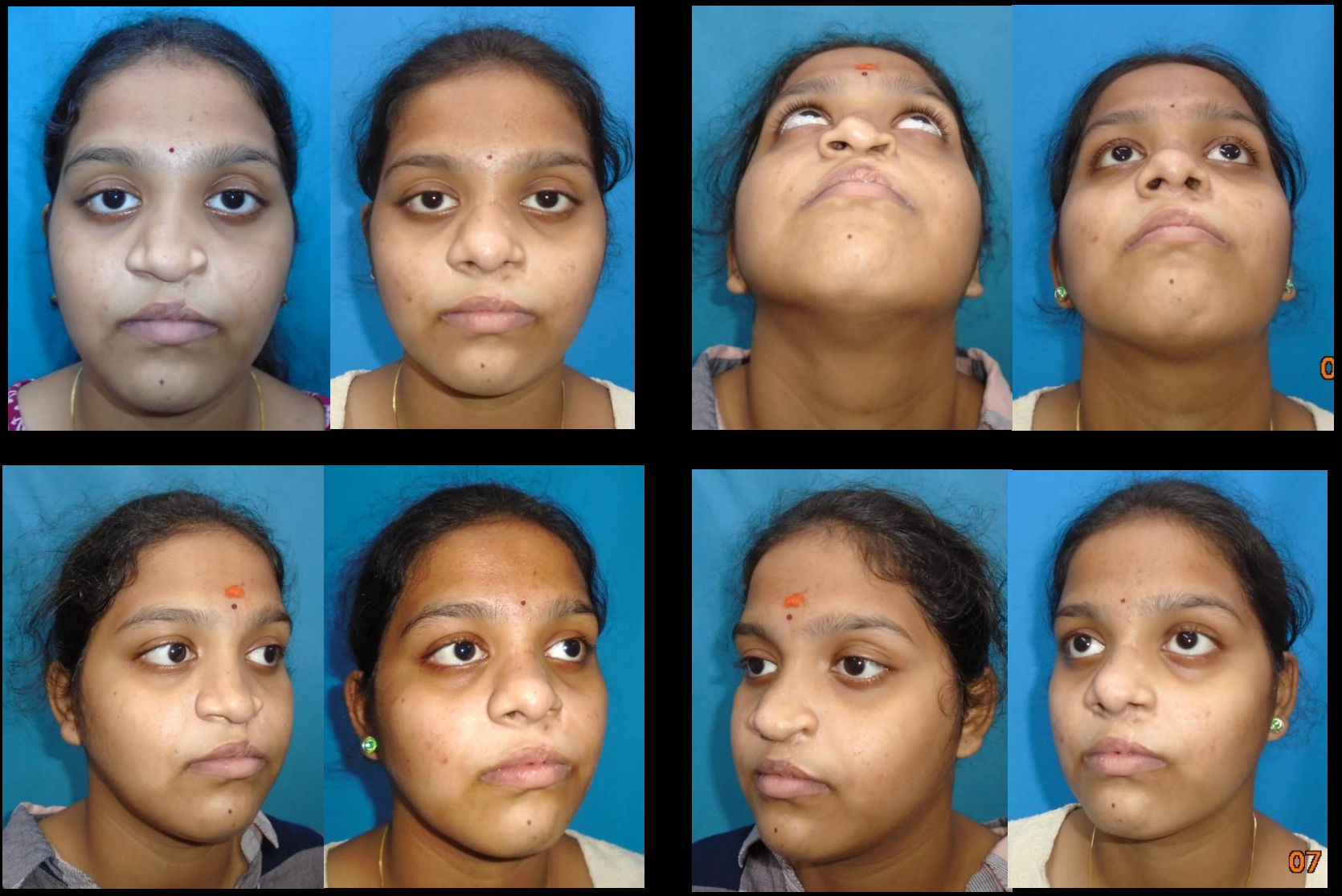
Unilateral Cleft Rhinoplasty with Costo-Chondral Grafting

- Closure

Unilateral Cleft Rhinoplasty with Costo-Chondral Grafting

Unilateral Cleft Rhinoplasty with Costo-Chondral Grafting

Unilateral Cleft Rhinoplasty with Costo-Chondral Grafting

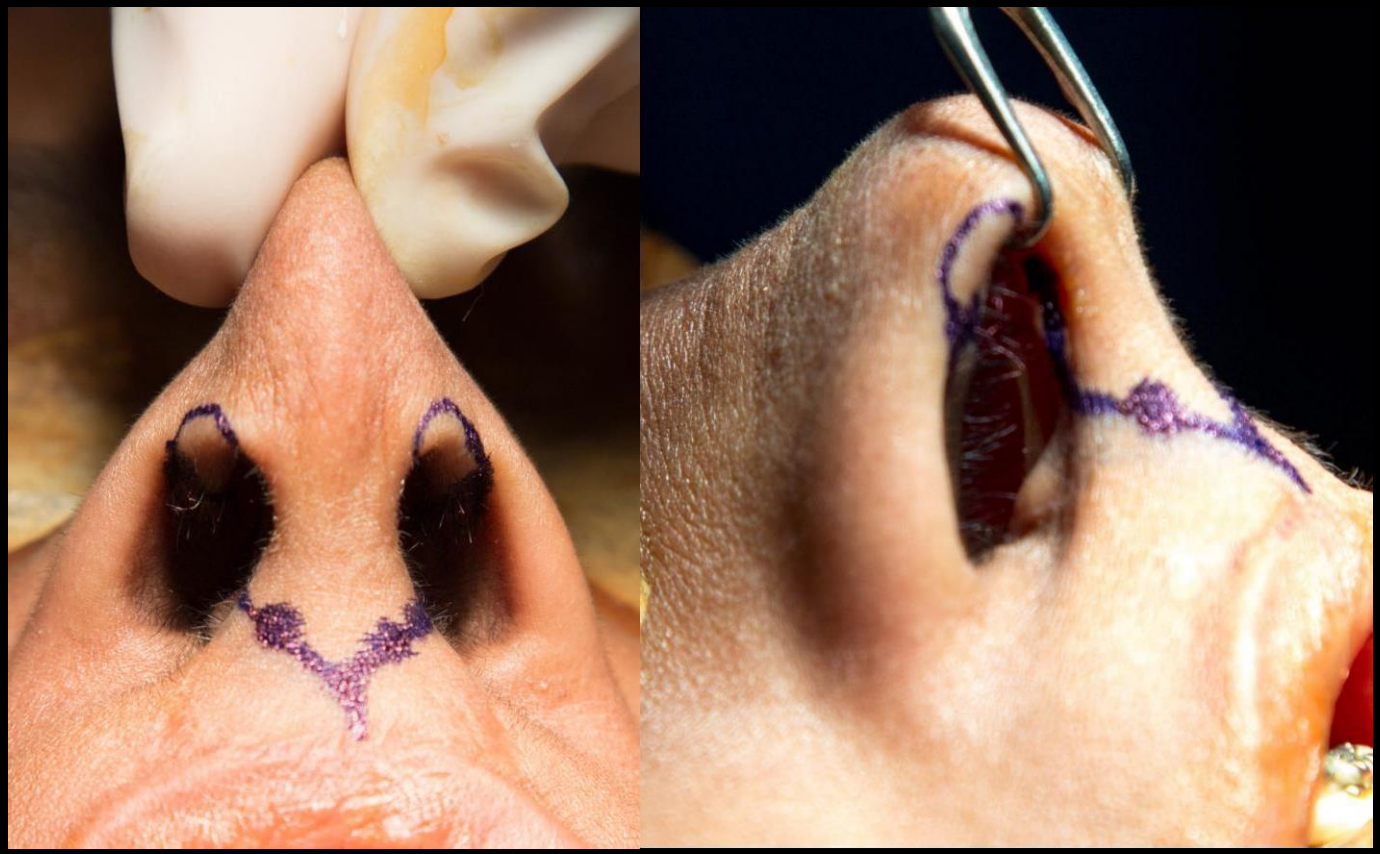


Unilateral Cleft Rhinoplasty with Costo-Chondral Grafting

Unilateral Cleft Rhinoplasty with Costo-Chondral Grafting

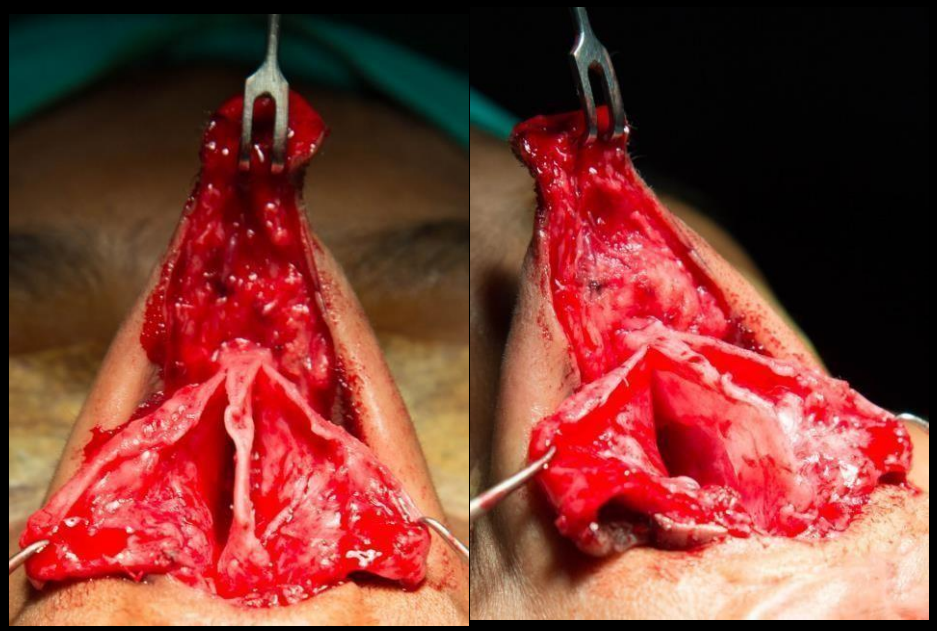
CLEFT RHINOPLASTY -SURGICAL APPROACH

BILATERAL CLEFT RHINOPLASTY



- Marking

Bilateral Cleft Rhinoplasty



- Exposing the septum
  - Note the extreme angle of caudal part of the septum due to its attachment to the anterior nasal spine which in cleft defects is lateralized towards the cleft side
  - Septoplasty is done by resecting the posterior and inferior end of the septum

Bilateral Cleft Rhinoplasty

- Positioning the strut made from the excised inferior and posterior part of septum

- Closing upper lateral cartilage
  - The upper lateral cartilage needs to be opened when there is gross deviation of septum to release the bend in theseptum

Bilateral Cleft Rhinoplasty

Bilateral Cleft Rhinoplasty with Septal Grafting

Bilateral Cleft Rhinoplasty with Auricular Grafting

Bilateral Cleft Rhinoplasty with Auricular Grafting

Bilateral Cleft Rhinoplasty with Costo-Chondral Grafting

Bilateral Cleft Rhinoplasty with Costo-Chondral Grafting

2 Dimensional Photographic Analysis

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Assessment of nostril symmetry after primary cleft rhinoplasty in patients with complete unilateral cleft lip and palate☆

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Strut graft
Nostril symmetry

ABSTRACT

The aim of this study was to assess the nostril symmetry following primary cleft rhinoplasty done with either a dorsal onlay or columellar strut graft in patients with non-syndromic complete unilateral cleft lip and palate. In this retrospective study 30 consecutive patients treated with autogenous or alloplastic dorsal onlay grafts and 30 consecutive patients treated with autogenous or alloplastic columellar strut grafts for complete unilateral cleft nose reconstruction were analyzed for nasal symmetry. The autogenous grafts used were costo-chondral or septal cartilage and the alloplastic graft used was high density polyethylene (Medpore®). Assessment of the nostril symmetry was done using a two-dimensional nasal analysis 24–30 months postoperatively. Ratios between cleft and noncleft side nostril for three parameters were used to assess symmetry namely nostril width, nostril height and nostril gap area. None of the three parameters showed statistically significant changes. A satisfactory, though not statistically significant, difference in symmetrical outcome could be achieved in both the groups with the exception of nostril width symmetry in group treated with dorsal onlay graft.

1. Introduction

Despite a plethora of surgical approaches aimed at correcting the cleft nose defect, no one procedure has been universally satisfactory in the repair of nasal deformities associated with cleft lip abnormalities (Trenite et al., 1997). The various treatment options for the correction of cleft rhinoplasty include columella lengthening, septal repositioning, radix grafting, tip augmentation, tip grafting, lower lateral cartilage repositioning, alar base wedge resections, piriform augmentation and nasal bone osteotomies (Trenitee et al., 1997). The typical problem with all the unilateral cleft nasal deformity which must be addressed is the nasal asymmetry. Each of the surgical techniques that have been used to correct the unilateral cleft nasal deformity has attempted to improve symmetry by translocation of the alar cartilage with its attached vestibular lining into a normal position, thereby establishing the normal vault and shape of the cartilage (Bashir et al., 2011). Several methods are reported in the literature to assess cleft lip nasal deformities, but difficulties in standardization make these studies less reproducible (Tanikawa et al., 2010).

The present study is an attempt to quantify and evaluate nostril symmetry achieved after primary rhinoplasty in patients with complete unilateral cleft lip and palate (UCLP) using a dorsal onlay and a columellar strut graft. The effect of these two techniques on the shape of the nostril was studied.

2. Materials and methods

To address the nasal deformity a retrospective study was conducted on patients operated for unilateral cleft nose deformity at our institute between January 2007 and February 2009. Thirty consecutive patients (11 males and 19 females) with dorsal grafting and 30 consecutive patients with strut grafting (11 males and 19 females) were enrolled in the study.

2.1. Surgical technique

Open structured rhinoplasty was performed by a single surgeon on all the patients. After a transcolumellar incision approach, the alar cartilages were exposed and released from their mucosal attachments. A back cut was given in the cleft side nasal vestibular mucosa to ensure a satisfactory lift of the buckled cleft side alar cartilages.

Patients with a depressed nasal bridge, drooping nasal tip and short columella of the nose were treated with a dorsal onlay graft

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Assessmentof nostril symmetry after primary cleft rhinoplasty in patientswith complete unilateralcleft lip and palate;

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Group 1- 30 consecutive patientswith dorsal grafting

Group 2- 30 consecutivepatientswith strut grafting

Measurement of nostril width and height

Measurement of nostril gap area

Conclusion:-

A decrease in the cleft side nostril width less than that of the noncleft side wasnoted after using a dorsal graft inspiteof a near perfect symmetrical outcome in terms of nostril height and nostril
gap area.

Thus a satisfactory symmetrical outcome could be achieved in both the treatment groups with the exception of nostril width symmetry in group treated with dorsumgraft.

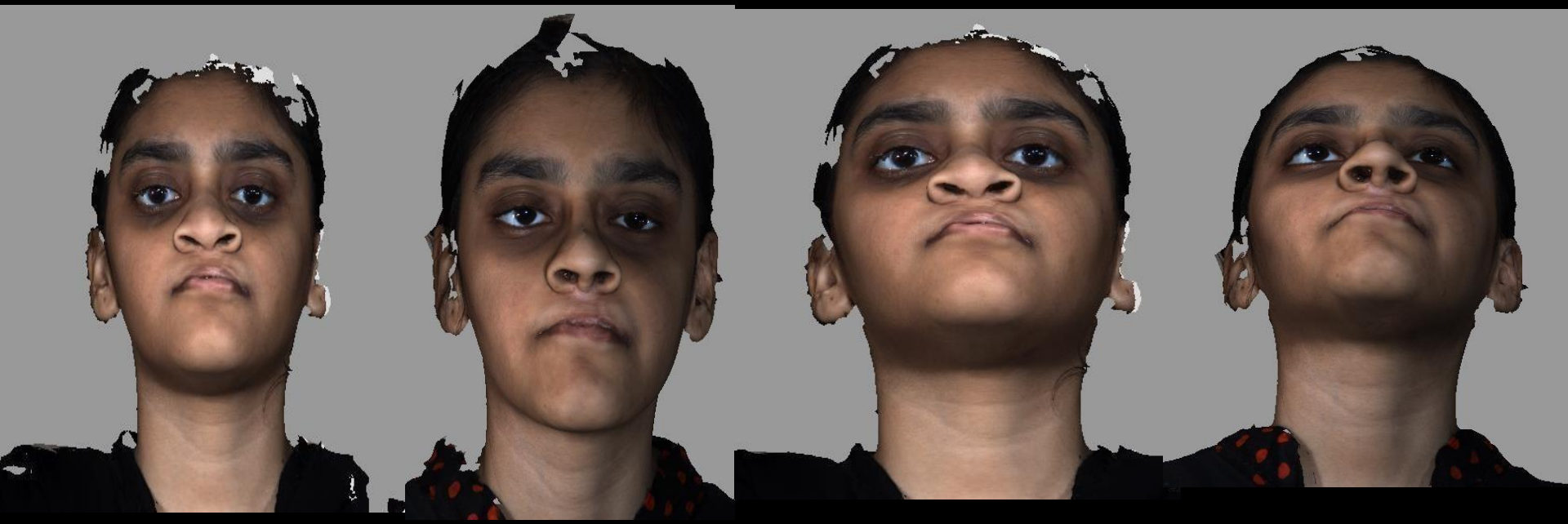
There was an improvement in the nostril symmetry in patients undergoing strut grafting. This improvement, however, was not statistically significant.

3 Dimensional Photographic Analysis

3 Dimensional Photographic Equipment

3 Dimensional LASER Equipment

3 Dimensional Photographic Analysis



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Quantitative analysis of aesthetic outcomes of morphofunctional septorhinoplasty for secondary cleft lip nasal deformity

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Abstract

The main aim of this study was to assess nasal symmetry after morphofunctional septorhinoplasty, more specifically, symmetry of the alar base and nostrils, and nasal projection, in patients with unilateral and bilateral cleft nasal deformities. Secondary cleft rhinoplasty was performed using morphofunctional septorhinoplasty techniques in 150 patients with unilateral and bilateral cleft lip and nose deformities. Nasal changes were analysed by measuring nasal tip projection, nostril height, nostril width, alar base width, and nasal gap area preoperatively and postoperatively on standard submentovertex view 2-dimensional photographs. In the unilateral cleft group there were statistically significant improvements ($p<0.001$) in ratios of nasal height and width ($p=0.024$) and nasal gap area, and in nasal tip projection and alar base width. In the bilateral cleft group there were statistically significant improvements in nasal gap area ratio ($p=0.009$), nasal tip projection, and alar base width. The morphofunctional septorhinoplasty technique improved aesthetic outcomes.

Keywords: Morphofunctional septorhinoplasty; Cleft lip nasal deformity; Secondary cleft rhinoplasty; Nasal symmetry

Introduction

The nose is the most conspicuous feature on the face so the minutest change in form (loss, deformity, or exaggeration) tends to draw undesired attention and sometimes disparaging remarks, which can be disquieting and make the subject self-conscious. The range of aesthetically acceptable variations of the nose regarding dimensions and form is huge compared with any other visible part of the body.[1]

A deformed nose secondary to cleft lip and palate poses multiple morphological and functional issues such as septal deviation, shortening of the columella, disproportionate nostril size, reduced nasal patency leading to difficulty in breathing, and many more, all of which may affect the physical and psychological well-being of the individual. In patients with bilateral clefts the short columella, and undefined and under-projected tip with a wide alar base, are troublesome areas. Thus, cleft rhinoplasty aims to restore the structure of the nose and its surroundings to improve aesthetics and function.[2]

Despite the availability of various surgical approaches for correction and multiple treatment philosophies, the cleft lip nasal deformity remains an arduous challenge to manage due to longstanding disruption and distortion of the basic architecture, and hence to the nature of the tissues making

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Quantitative Analysis of Aesthetic Outcomes of Morphofunctional Septorhinoplasty for Secondary Cleft Lip Nasal Deformity

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The main aim of this study was to assess nasal symmetry after morphofunctional septorhinoplasty, more specifically, symmetry of the alar base and nostrils, and nasal projection, in patients with unilateral and bilateral cleft nasal deformities.

Conclusion: The technique described here has achieved significant changes in the cleft lip nasal deformity from the aesthetic point of view .

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